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AD 867551

METEOROLOGICAL DATA REPORT

NIKE-HYDAC STV-92  
(12 March 1970)

BY

GORDON DONAWAY

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WHITE SANDS MISSILE RANGE, NEW MEXICO

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METEOROLOGICAL DATA REPORT

NIKE-HYDAC STV-92  
(12 March 1970)

By

Gordon L. Dunaway

DR-503

March 1970

DA Task 1T665702D127-02

ATMOSPHERIC SCIENCES OFFICE  
WHITE SANDS MISSILE RANGE, NEW MEXICO

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ABSTRACT

Hatatological data gathered for launching of MIKE-HYDAC, STV-92, are presented for the Space and Missile Systems Organization, AFMDC, Holloman Air Force Base, New Mexico, and for ballistic studies. The data appear, along with calculated ballistic data, in tabular form.

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## INTRODUCTION

Nike-Hydec, STV-92, was launched from Launch Complex 33, left bora of L-361, White Sands Missile Range (WSMR), New Mexico, at 1422 hours MST, 12 March 1970.

Meteorological data used in conjunction with theoretical calculations to predict rocket impact were collected by the Meteorological Support Technical Area, Atmospheric Sciences Office (ASO), WSMR, New Mexico. Ballistics Meteorologists for this firing were Gordon Dunaway and Len E. Carter.

## DISCUSSION

Wind data for the first 216 feet above the surface were obtained from a system composed of five Aerovanes mounted on a 200-foot tower and cabled to component wind indicators.

From 216 to 4,000 feet above the surface, wind data were obtained from T-9 Radar tracked balloon ascents.

Temperature, pressure, and humidity data, along with upper wind data from 4,000 to approximately 100,000 feet above the surface, were obtained from standard rawinsonde observations.

Mean wind component values in each ballistic zone were determined from vertical cross sections by the equal-area method.

Theoretical rocket performance values and wind-weighting values as a function of altitude were provided by the Atmospheric Sciences Office (ASO) and are the basis for the data appearing in Table I.

PAYOUT	220.	Pounds.
CORIOLIS DISPLACEMENT	WEST	3.9
	MILES	
TIME	20.0	Seconds
SECOND-STAGE IGNITION		
ALTITUDE	35000.	Feet MSL
TIME	23.1	Seconds
PEAK		
ALTITUDE	730,000	Feet MSL
	2.35	MILES / MPH
UNIT WIND EFFECT		
		MILES / MPH
		MILES / MPH
TOWER TILT EFFECT	14.0	Miles/Degree

TABLE I. THEORETICAL ROCKET PERFORMANCE VALUES  
NIKE-HYDAC, STV-92

LAYERS IN FEET ABOVE GROUND	BALLISTIC FACTORS
11- 60	1.165
60- 105	.0844
108- 148	.0535
148- 184	.0410
184- 216	.0235
216- 300	.0592
300- 400	.0520
400- 600	.0790
600- 800	.0530
800- 1000	.0407

LAYERS IN FEET ABOVE GROUND	BALLISTIC FACTORS
1000- 1400	.0742
1400- 2000	.0669
2000- 2500	.0341
2500- 3000	.0237
3000- 3500	.0143
3500- 4000	.0051
4000- 5000	-.0051
5000- 9000	-.0117
9000- 15000	-.0168
15000- 21000	-.0160

LAYERS IN FEET ABOVE GROUND	BALLISTIC FACTORS
21000- 26000	-.0096
26000- 31000	-.0048
31000- 36000	.1288
36000- 41000	.0346
41000- 46000	.0256
46000- 51000	.0152
51000- 36000	.0093
56000- 61000	.0016
61000- 100000	-.0012

TABLE II. BALLISTIC FACTORS  
NIKE-HYDAG STV-92

AERO-VANE NO. *	MEAN WIND COMPONENTS IN MILES PER HOUR							
	1 1155 MST	2 1225 MST	3 1300 MST	4 1310 MST	5 1315 MST	6 1325 MST	7 1335 MST	
N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	
1 3.0N	1.0E	8.0N	3.0W	7.0N	0.0	5.0N	2.0W	6.0N
2 4.0	2.0	8.0	1.0	7.0	0.0	5.0	0.0	5.0
3 5.0	2.0	8.0	1.0	7.0	0.0	4.0	0.0	6.0
4 4.0	3.0	9.0	0.0	8.0	0.0	6.0	0.0	5.0
5 2.0	2.0	8.0	0.0	6.0	0.0	6.0	0.0	4.0

AERO-VANE NO. *	MEAN WIND COMPONENTS IN MILES PER HOUR							
	8 1345 MST	9 1350 MST	10 1400 MST	11 1410 MST	12 1415 MST	13 1422 MST		
N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	
1 8.0N	4.0E	12.0N	3.0E	10.0N	2.0W	15.0N	2.0E	13.0N
2 10.0	4.0	12.0	4.0	10.0	2.0	15.0	4.0	12.0
3 12.0	6.0	12.0	4.0	11.0	2.0	15.0	4.0	14.0
4 13.0	6.0	13.0	6.0	12.0	0.0	17.0	5.0	14.0
5 10.0	4.0	14.0	5.0	13.0	0.0	15.0	4.0	12.0

TABLE III. ANEMOMETER WIND SPEED AND DIRECTION  
NIKE-HYDAC STV-92

\* Heights corresponding to Aerovane Numbers: 1 = 35 Feet 3 = 128 Feet 5 = 200 Feet  
2 = 88 Feet 4 = 168 Feet

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS IN MILES PER HOUR											
	1 1155 MST	2 1225 MST	3 1300 MST	4 1310 MST	5 1415 MST	6 1325 MST	7 1335 MST	E-W	N-S	E-W	N-S	E-W
216- 300	2.0N	1.0E	7.5N	0.0	5.5N	5.5E	6.0N	0.0	6.0N	5.5E	4.0N	5.5E
300- 400	3.5	1.5	7.0	0.0	6.5	3.5	5.5	1.5E	9.5	6.0	4.5	3.5
400- 600	3.0	3.0	0.5W	5.0	0.5	4.0	2.5	7.5	2.5	2.5	5.5	8.5
600- 800	1.0S	1.0W	4.5	1.0	5.0	3.0	6.0	5.0	4.0	4.0	5.5	10.0
800-1000	1.0N	2.0	7.0	2.0E	5.0	4.5	3.5	6.5	2.5	6.0	3.0	8.5
1000-1400	1.0	0.0	3.5	2.5	4.5	3.0	3.5	0.0	6.0	7.0	3.0	8.0
1400-2000	0.0	0.5E	6.5	1.0	4.0	0.5	5.5	0.0	6.0	3.5	7.5	2.0
2000-2500	1.5N	1.5W	6.0	1.0	6.5	2.0W	5.5	1.0W	9.0	1.5W	10.0	3.0
2500-3000	2.0	8.5	4.0	5.0	6.0	2.5	2.0	9.0	5.0	8.0	7.0	5.5
3000-3500	0.0	10.5	0.5	10.0	4.0	10.5	3.5	11.5	2.5	11.0	6.0	9.5
3500-4000	2.5S	6.0	1.5S	6.5	2.0	12.5	8.5	11.5	7.0	11.0	9.0	9.5
												10.5

TABLE IV. PILOT-BALLOON-MEASURED WIND DATA  
NIKE-HYDAC STV-92

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPARISONS IN MILES PER HOUR							
	8 1345 MST	9 1350 MST	10 1400 MST	11 1410 MST	12 1418 MST	13 1422 MST	W-E	N-S
216- 300	10.0N	0.0	11.0N	5.5E	10.0N	2.0E	14.0N	4.0E
300- 400	9.5	1.0E	7.0	5.0	9.0	4.0	11.0	5.0
400- 600	12.0	3.5	8.3	2.5	12.5	3.5	10.5	4.0
600- 800	15.0	4.5	10.5	1.5	13.0	2.0	12.5	4.0
800-1000	14.5	3.5	10.5	2.5	13.5	2.0	11.0	2.0
1000-1400	11.0	5.5	12.0	2.5	14.0	3.0	11.0	0.5
1400-2000	9.5	4.0	10.0	4.5	13.0	3.5	11.0	3.5
2000-2500	7.5	1.5	12.5	5.0	12.0	4.0	10.0	4.5
2500-3000	6.0	2.0W	12.0	2.0	9.5	2.0	10.0	3.0
3000-3500	4.5	4.5	8.0	4.0W	7.0	3.5W	9.0	2.0
3500-4000	5.0	9.0	4.5	8.5	6.5	10.0	6.0	5.0W

TABLE IV. PILOT-BALLOON-MEASURED WIND DATA (CONT)  
NIKE-HYDAC STV-92

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS IN KNOTS				
	1055 MST	1423 MST	N-S	E-W	N-S
					E-W
4000- 5000	4.0S	7.0W	6.0N	0.0	
5000- 9000	6.0N	10.5	9.5	11.5W	
9000-15000	12.5	35.0	20.0	16.5	
15000-21000	19.0	51.5	21.0	36.5	
21000-26000	26.0	71.5	19.5	53.5	
26000-31000	28.5	77.5	30.5	53.0	
31000-36000	20.0	55.5	23.5	40.5	
36000-41000	14.0	38.5	15.0	41.5	
41000-46000	15.5	42.5	22.0	38.0	
46000-51000	12.0	34.0	19.5	34.0	
51000-56000	7.0	19.0	0.0	26.0	
56000-61000	5.0	13.0	0.0	11.0	

TABLE V.  
RAWINSONDE-MEASURED WIND DATA  
NIKE-NYDAC STV-92

STATION ALTITUDE 3989.00 FEET MSL.  
12 MAY. 70 1055 HRS MST  
ASSEMBLY NO. 231

SIGNIFICANT LEVEL DATA  
OTAGO 20231  
WHITE SANDS

TABLE VI

PRESSURE MILLIBARS	GEOMETRIC ALTITUDE FEET	TEMPERATURE DEGREES CENTIGRADE	AIR DEWPOINT DEGREES CENTIGRADE	RELATIVE HUMIDITY PERCENT
880.4	3989.0	7.0	0.0	01.0
870.0	4307.7	3.2	0.6	01.0
820.0	5073.0	-0.4	5.5	00.0
778.0	7256.4	-0.6	-9.1	51.0
716.0	8423.5	-4.2	-16.5	38.0
623.0	12963.4	-13.6	-23.1	49.0
537.0	16615.3	-22.1	-29.6	51.0
515.0	17623.3	-23.0	-31.4	30.0
497.0	18477.3	-24.1	-31.9	49.0
431.0	21836.2	-32.7	-41.6	41.0
424.0	22215.8	-34.3	-41.8	39.0
385.0	24429.7	-37.7	-47.4	36.0
378.0	24845.6	-38.4	-49.6	30.0
362.0	45821.1	-39.7	0.0	00.0
355.0	26259.4	-40.7	0.0	00.0
341.0	27147.9	-47.3	0.0	00.0
292.0	30506.7	-49.7	0.0	00.0
267.0	34424.9	-52.0	0.0	00.0
239.0	34771.9	-54.9	0.0	00.0
223.0	36232.5	-54.9	0.0	00.0
207.0	37800.7	-55.3	0.0	00.0
201.0	38414.4	-55.1	0.0	00.0
193.0	39272.3	-55.0	0.0	00.0
186.0	40049.2	-54.6	0.0	00.0
161.0	43081.9	-56.3	0.0	00.0
151.0	44426.5	-55.4	0.0	00.0
137.0	46468.5	-56.1	0.0	00.0
116.0	49954.0	-58.1	0.0	00.0
96.0	52667.7	-58.4	0.0	00.0
78.0	56141.1	-61.9	0.0	00.0

\*\* RELATIVE HUMIDITY NOT SUPPLIED. ZERO VALUE ASSUMED FOR COMPUTATIONS.

STATION ALTITUDE 3989.00 FEET MSL  
12 MAR. 70 1055 HRS MST  
ASCENSION NO. 231

SIGNIFICANT LEVEL DATA

0710020231

WHITE SANDS

WSTM SITE COORDINATES  
488580.00 FEET E  
185045.00 FEET N

TABLE VI (Cont.)

PRESSURE MILLIBARS	GEOMETRIC ALTITUDE FEET	TEMPERATURE DEGREES	AIR DEWPOINT DEGREES	REL.HUM. PERCENT
59.0	63899.9	-57.6	0.	-0. **
43.0	70504.0	-57.0	0.	-0. **
41.0	71516.4	-50.0	0.	-0. **
30.0	78213.2	-53.3	0.	-0. **
25.0	82135.9	-48.7	0.	-0. **
18.5	88717.3	-46.4	0.	-0. **
17.0	90576.1	-46.4	0.	-0. **
13.0	96539.3	-41.4	0.	-0. **
8.4	106422.0	-38.4	0.	-0. **

\*\* RELATIVE HUMIDITY NOT SUPPLIED. ZERO VALUE ASSUMED FOR COMPUTATIONS.

STATION ALTITUDE 3989.00 FEET MSL  
 12 MAR. 70 1055 HRS MST  
 ASCENSION NO. 231

UPPER AIR DATA  
 071002Z231  
 WHITE SANDS

TABLE VII

WSTN SITE COORDINATES  
 488580000 FEET E  
 185045.00 FEET N

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEPOINT DEGREES	REL. HUM. PERCENT	SOUND CUBIC METER KNOTS	WIND DATA		INDEX OF REFRACTION
					DIRECTION DEGREES (TN)	SPEED KNOTS	
3989.0	880.4	7.0	0.0	61.0	1092.1	652.6	2.9
4000.0	880.0	6.9	-0.1	61.0	1092.2	652.4	2.9
4500.0	863.7	2.8	-3.8	61.9	1088.4	647.4	3.5
5000.0	847.5	1.7	-4.4	64.1	1072.5	646.1	4.0
5500.0	831.7	0.5	-5.0	66.3	1056.7	644.8	4.6
6000.0	816.1	-0.3	-5.8	66.4	1040.1	643.8	5.2
6500.0	800.7	-0.3	-7.0	60.3	1020.5	643.8	5.7
7000.0	785.6	-0.2	-8.4	56.2	1001.3	643.8	6.2
7500.0	770.8	-0.7	-9.9	49.5	984.1	643.2	7.0
8000.0	756.1	-1.6	-11.6	46.5	968.9	642.1	7.9
8500.0	741.8	-2.5	-13.3	43.5	953.8	640.9	8.8
9000.0	727.7	-3.4	-15.0	40.5	939.1	639.8	7.8
9500.0	713.8	-4.4	-16.6	38.2	924.6	638.6	8.2
10000.0	700.0	-5.7	-17.5	39.1	911.2	637.0	8.7
10500.0	686.3	-7.1	-18.4	40.1	898.0	635.4	9.3
11000.0	673.0	-8.4	-19.3	41.1	884.9	633.8	10.2
11500.0	659.9	-9.7	-20.3	42.1	872.1	632.2	12.0
12000.0	647.0	-11.0	-21.2	43.1	859.5	630.6	10.2
12500.0	634.4	-12.4	-22.2	44.1	847.1	629.0	17.1
13000.0	622.1	-13.7	-23.1	45.1	834.9	627.4	20.0
13500.0	609.5	-14.8	-24.0	45.9	821.8	626.0	23.2
14000.0	597.3	-16.0	-24.9	46.7	808.9	624.5	26.2
14500.0	585.3	-17.2	-25.8	47.5	796.2	623.1	28.7
15000.0	573.5	-18.3	-26.7	48.3	783.8	621.7	30.8
15500.0	561.9	-19.5	-27.6	49.2	771.5	620.3	32.5
16000.0	550.6	-20.7	-28.5	50.0	759.5	618.8	34.6
16500.0	539.5	-21.8	-29.4	50.8	747.7	617.4	37.3
17000.0	528.5	-22.7	-30.3	50.6	735.1	616.3	39.7
17500.0	517.6	-23.6	-31.2	50.1	722.5	615.2	41.2
18000.0	507.0	-23.9	-31.6	49.6	708.5	614.0	42.9

STATION ALTITUDE 3989.00 FEET MSL  
12 MAR. 70 1055 HRS MST  
ASCENSION NU. 231

UPPER AIR DATA  
0710020431  
WHITE SANDS  
INDEX

GEOMETRIC PRESSURE TEMPERATURE AIR DEMPANT REL. HUM. DENSITY SPEED OF  
ALTITUDE MILLIBARS DEGREES CENTIGRADE PERCENT CUBIC METER KNOTS  
MSL FEET

18500.0	496.5	-24.2	-32.0	43.9	694.6	014.5	294.0	45.7
19000.0	486.1	-25.4	-33.4	47.8	683.5	012.9	295.7	48.2
19500.0	478.9	-26.7	-34.9	46.6	672.7	011.3	295.6	49.6
20000.0	465.9	-28.0	-36.3	45.4	662.0	009.7	295.1	51.7
20500.0	456.1	-29.3	-37.8	44.2	651.5	008.1	294.4	54.4
21000.0	446.6	-30.6	-39.2	43.0	641.3	006.5	295.5	54.0
21500.0	437.2	-31.8	-40.7	41.6	631.1	004.9	297.9	52.3
22000.0	428.0	-32.5	-41.7	40.1	619.6	004.0	298.0	59.0
22500.0	418.8	-33.0	-42.5	39.6	607.5	003.5	293.7	65.7
23000.0	409.8	-34.2	-43.8	37.9	557.4	001.9	292.8	62.6
23500.0	400.9	-35.4	-45.0	37.3	587.6	000.4	291.3	51.9
24000.0	392.3	-36.7	-46.3	36.6	577.9	000.8	290.5	55.1
24500.0	383.8	-37.8	-47.8	35.0	568.2	000.2	286.8	64.7
25000.0	375.4	-38.6	-51.3	25.2**	557.7	000.7	286.0	58.6
25500.0	367.2	-39.3	-59.5	9.9**	547.0	005.3	285.5	60.1
26000.0	359.1	-40.1	0**	0**	536.9	004.4	285.5	65.2
26500.0	351.2	-42.5	0**	0**	530.4	001.4	284.9	68.4
27000.0	343.3	-46.2	0**	0**	527.0	000.6	284.1	70.7
27500.0	335.5	-47.6	0**	0**	518.1	000.8	283.7	72.9
28000.0	327.8	-47.9	0**	0**	507.1	004.4	283.5	73.0
28500.0	320.4	-48.3	0**	0**	496.3	003.9	282.1	76.3
29000.0	313.0	-48.6	0**	0**	485.8	003.5	281.8	76.0
29500.0	305.9	-49.0	0**	0**	475.4	003.0	281.3	76.0
30000.0	298.9	-49.3	0**	0**	465.3	002.5	280.8	74.4
30500.0	291.1	-49.7	0**	0**	455.4	002.1	281.2	74.7
31000.0	285.4	-50.3	0**	0**	446.1	001.3	281.5	82.9
31500.0	278.8	-50.9	0**	0**	437.0	000.5	281.7	81.4
32000.0	272.3	-51.5	0**	0**	428.1	000.7	281.9	80.4
32500.0	266.1	-52.1	0**	0**	419.3	000.9	282.6	83.4
33000.0	259.8	-52.7	0**	0**	410.7	001.1	283.3	85.4

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
 12 MAR. 70 1055 HRS MST.  
 ASCENSION NO. 231

UPPER AIR DATA  
 0710020231  
 WHITE SANDS

WITH SITE COORDINATES  
 488580.00 FEET E  
 185045.00 FEET N

TABLE VII (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREE CENTIGRADE	REL.HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	DIRECTION DEGREES(STN)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION
33500.0	233.8	-53.3	0.	402.3	577.3	284.8	79.5	1.000090
34000.0	247.9	-53.9	0.	394.0	576.5	286.3	73.9	1.000088
34500.0	242.1	-54.6	0.	385.9	575.7	287.7	72.0	1.000086
35000.0	236.4	-54.8	0.	377.3	575.4	289.2	70.1	1.000084
35500.0	230.9	-54.6	0.	368.1	575.6	290.3	67.3	1.000082
36000.0	225.5	-54.4	0.	359.1	572.9	291.4	64.5	1.000080
36500.0	220.2	-54.5	0.	350.8	575.8	291.8	62.4	1.000078
37000.0	215.0	-54.8	0.	343.1	575.4	291.9	60.7	1.000076
37500.0	210.0	-55.1	0.	335.5	575.0	292.2	58.7	1.000075
38000.0	205.0	-55.2	0.	327.8	574.8	292.8	56.6	1.000073
38500.0	200.2	-55.2	0.	320.0	574.9	293.2	54.8	1.000071
39000.0	195.5	-55.6	0.	313.1	574.3	293.4	53.7	1.000070
39500.0	190.9	-55.4	0.	305.6	574.5	293.4	52.6	1.000069
40000.0	186.4	-54.7	0.	297.3	575.5	292.6	51.8	1.000068
40500.0	182.1	-54.9	0.	290.6	575.3	291.8	51.0	1.000065
41000.0	177.8	-55.1	0.	284.1	574.9	290.4	49.9	1.000063
41500.0	173.6	-55.4	0.	277.8	574.6	288.9	48.8	1.000062
42000.0	169.5	-55.7	0.	271.6	574.2	287.5	49.2	1.000060
42500.0	165.5	-56.0	0.	265.5	573.8	286.0	49.9	1.000059
43000.0	161.6	-56.3	0.	259.6	573.5	285.1	50.3	1.000058
43500.0	157.8	-56.0	0.	253.2	573.8	284.6	50.3	1.000056
44000.0	154.1	-55.7	0.	246.9	574.2	284.4	49.5	1.000055
44500.0	150.5	-55.4	0.	240.8	574.5	284.9	47.1	1.000054
45000.0	146.9	-55.6	0.	235.3	574.3	285.3	44.5	1.000052
45500.0	143.5	-55.8	0.	230.0	574.1	285.9	40.9	1.000051
46000.0	140.1	-55.9	0.	224.7	573.9	286.4	37.4	1.000050
46500.0	136.8	-56.1	0.	219.6	573.6	285.7	36.3	1.000049
47000.0	133.6	-56.4	0.	214.7	573.3	285.1	35.1	1.000048
47500.0	130.4	-56.7	0.	209.9	572.9	283.9	36.2	1.000047
48000.0	127.3	-57.0	0.	205.2	572.5	282.6	37.5	1.000046

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
12 MAR. 70 1055 HRS HST  
ASCENSION NO. 231

UPPER AIR DATA  
0710020231  
WHITE SANDS

TABLE VII (Cont.)

GEOMETRICAL ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEPOINT DEGREES CENTIGRADE	REL.HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DIRECTION DEGREES(TN)	WIND SPEED KNOTS	INDEX OF REFRACTION
48500.0	124.3	-57.3	**	200.6	572.1	281.7	37.9	1.000045
47000.0	121.3	-57.6	-0°	196.1	571.7	280.9	38.0	1.000044
42500.0	118.5	-57.8	-0°	191.7	571.3	281.0	38.3	1.000043
50000.0	115.7	-58.1	-0°	187.4	571.0	281.9	38.0	1.000042
50500.0	112.9	-58.1	-0°	183.0	571.0	282.0	40.0	1.000041
51000.0	110.2	-58.4	-0°	178.6	570.9	283.0	41.0	1.000040
51500.0	107.6	-58.2	-0°	174.4	570.8	283.6	42.0	1.000039
52000.0	105.0	-58.3	-0°	170.3	570.8	285.3	39.5	1.000038
52500.0	102.5	-58.3	-0°	166.3	570.7	286.8	36.1	1.000037
53000.0	100.1	-58.3	-0°	162.4	570.7	282.9	31.0	1.000036
53500.0	97.7	-58.4	-0°	158.5	570.6	279.1	27.5	1.000035
54000.0	95.4	-58.5	-0°	154.8	570.5	278.9	24.6	1.000034
54500.0	93.1	-58.9	-0°	151.4	569.9	279.3	21.0	1.000034
55000.0	90.9	-59.3	-0°	148.1	569.4	278.5	23.0	1.000033
55500.0	88.7	-59.7	-0°	144.8	568.8	276.8	29.0	1.000032
56000.0	86.6	-60.1	-0°	141.6	568.3	275.3	33.5	1.000032
56500.0	84.5	-60.6	-0°	138.4	567.7	275.2	33.6	1.000031
57000.0	82.4	-61.0	-0°	135.4	567.2	275.1	33.8	1.000030
57500.0	80.5	-61.4	-0°	132.4	566.6	274.2	37.5	1.000029
58000.0	78.5	-61.8	-0°	129.5	566.1	273.1	42.4	1.000028
58500.0	76.7	-61.6	-0°	126.3	566.3	271.6	43.0	1.000027
59000.0	74.8	-61.3	-0°	123.0	566.8	269.4	36.3	1.000027
59500.0	73.0	-60.9	-0°	119.9	567.3	267.7	30.0	1.000027
60000.0	71.3	-60.5	-0°	116.8	567.8	273.4	29.7	1.000026
60500.0	69.6	-60.1	-0°	113.8	568.3	279.1	29.4	1.000025
61000.0	67.9	-59.8	-0°	110.9	568.8	289.3	22.4	1.000025
61500.0	66.3	-59.4	-0°	108.0	569.3	301.1	23.4	1.000024
62000.0	64.7	-59.0	-0°	105.3	569.8	306.0	8.0	1.000023
62500.0	63.1	-58.6	-0°	102.6	570.3	299.4	10.0	1.000023
63000.0	61.6	-58.3	-0°	99.9	570.8	292.7	12.0	1.000022

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
12 HRS. 70 1055 HRS MST  
ASCENSION NO. 231

UPPER AIR DATA  
0710020231  
WHITE SANDS

WSTM SITE COORDINATES  
468530.00 FEET E  
185015.00 FEET N

TABLE VII (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEPOINT DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	DIRECTION DEGREES (TN)	WIND SPEED KNOTS	INDEX OF REFRACTION
63500.0	60.2	-57.9	0*	97.4	571.3	282.7	11.4	1.000022
64000.0	58.7	-57.6	0*	94.9	571.7	272.1	9.3	1.000021
64500.0	57.3	-57.5	0*	92.6	571.7	262.9	8.0	1.000021
65000.0	56.0	-57.5	0*	90.4	571.8	256.8	8.6	1.000020
65500.0	54.6	-57.5	0*	88.3	571.9	250.7	9.2	1.000020
66000.0	53.4	-57.4	0*	86.2	571.9	231.2	9.2	1.000019
66500.0	52.1	-57.4	0*	84.1	572.0	205.4	9.0	1.000019
67000.0	50.9	-57.3	0*	82.1	572.0	182.8	8.8	1.000018
67500.0	49.7	-57.3	0*	80.4	572.1	189.6	9.9	1.000018
68000.0	48.5	-57.2	0*	78.2	572.2	196.4	11.0	1.000017
68500.0	47.3	-57.2	0*	76.4	572.2	209.8	13.7	1.000017
69000.0	46.2	-57.1	0*	74.5	572.3	226.6	17.2	1.000017
69500.0	45.1	-57.1	0*	72.8	572.3	240.0	20.5	1.000016
70000.0	44.1	-57.0	0*	71.0	572.4	245.9	23.5	1.000016
70500.0	43.0	-57.0	0*	69.3	572.5	251.9	26.5	1.000015
71000.0	42.0	-53.6	0*	66.7	571.0	251.8	25.4	1.000015
71500.0	41.0	-50.1	0*	64.1	581.5	251.5	24.2	1.000014
72000.0	40.1	-50.2	0*	62.7	581.4	248.7	21.6	1.000014
72500.0	39.2	-50.5	0*	61.3	581.0	244.2	17.9	1.000014
73000.0	38.3	-50.7	0*	59.9	580.7	239.8	14.5	1.000013
73500.0	37.4	-51.0	0*	58.6	580.4	237.2	13.3	1.000013
74000.0	36.5	-51.2	0*	57.3	580.1	234.6	12.2	1.000013
74500.0	35.7	-51.5	0*	56.1	579.7	232.8	11.3	1.000012
75000.0	34.9	-51.7	0*	54.8	579.4	236.3	12.0	1.000012
75500.0	34.0	-52.0	0*	53.6	579.1	239.7	12.8	1.000012
76000.0	33.3	-52.2	0*	52.5	578.8	243.2	13.5	1.000012
76500.0	32.5	-52.5	0*	51.3	578.5	244.1	15.3	1.000011
77000.0	31.7	-52.7	0*	50.2	578.1	244.9	17.0	1.000011
77500.0	31.0	-52.9	0*	49.1	577.8	245.7	18.8	1.000011
78000.0	30.3	-53.2	0*	48.0	577.5	247.7	20.5	1.000011

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
12 MAR. 70 1055 HRS MST  
AS ENSIUN ND. 231

UPPER AIR DATA  
0710020231  
WHITE SANDS  
TABLE VII (Cont.)

GEOMETRIC ALTITUDE HSL FEET	PRESSURE MILLIBARS	TEMPERATURE DEGREES	AIR DEWPPOINT DEGREES	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES (TN.)	SPEED KNOTS	INDEX OF REFRACTION
78500.0	29.6	-53.0	0°	-0.**	46.8	577.8	250.3	22.0	1.000010
79000.0	28.9	-52.4	0°	-0.**	45.6	578.6	252.8	23.6	1.000010
79500.0	28.3	-51.8	0°	-0.**	44.5	579.3	253.9	24.3	1.000010
80000.0	27.6	-51.2	0°	-0.**	43.3	580.1	253.5	24.1	1.000010
80500.0	27.0	-50.6	0°	-0.**	42.2	580.9	253.0	23.8	1.000009
81000.0	26.4	-50.0	0°	-0.**	41.2	581.6	253.3	23.6	1.000009
81500.0	25.7	-49.4	0°	-0.**	40.1	582.4	255.5	23.5	1.000009
82000.0	25.2	-48.9	0°	-0.**	39.1	583.1	257.7	23.3	1.000009
82500.0	24.6	-48.6	0°	-0.**	38.1	583.5	259.8	23.2	1.000008
83000.0	24.0	-48.4	0°	-0.**	37.3	583.7	260.5	25.6	1.000008
83500.0	23.5	-48.2	0°	-0.**	36.4	584.0	261.2	27.9	1.000008
84000.0	23.0	-48.0	0°	-0.**	35.5	584.2	262.0	30.3	1.000008
84500.0	22.4	-47.9	0°	-0.**	34.7	584.4	261.5	31.1	1.000008
85000.0	21.9	-47.7	0°	-0.**	33.9	584.7	260.8	31.6	1.000008
85500.0	21.4	-47.5	0°	-0.**	33.1	584.9	260.0	32.0	1.000007
86000.0	20.9	-47.3	0°	-0.**	32.3	585.1	258.2	31.9	1.000007
86500.0	20.5	-47.2	0°	-0.**	31.6	585.3	255.7	31.5	1.000007
87000.0	20.0	-47.0	0°	-0.**	30.8	585.6	253.2	31.2	1.000007
87500.0	19.6	-46.8	0°	-0.**	30.1	585.8	251.5	29.7	1.000007
88000.0	19.1	-46.7	0°	-0.**	29.4	586.0	250.5	27.2	1.000007
88500.0	18.7	-46.5	0°	-0.**	28.7	586.2	249.5	24.7	1.000006
89000.0	18.3	-46.4	0°	-0.**	28.1	586.3	248.7	23.5	1.000006
89500.0	17.9	-46.4	0°	-0.**	27.4	586.3	248.4	24.3	1.000006
90000.0	17.5	-46.4	0°	-0.**	26.8	586.3	248.0	25.1	1.000006
90500.0	17.1	-46.4	0°	-0.**	26.2	586.3	247.5	25.4	1.000006
91000.0	16.7	-46.0	0°	-0.**	25.6	586.8	246.3	23.9	1.000006
91500.0	16.3	-45.6	0°	-0.**	25.0	587.3	245.2	22.5	1.000006
92000.0	15.9	-45.2	0°	-0.**	24.4	587.9	243.8	21.1	1.000005
92500.0	15.6	-44.8	0°	-0.**	23.8	588.4	238.3	21.9	1.000005
93000.0	15.2	-44.4	0°	-0.**	23.2	589.0	232.7	22.7	1.000005

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
 12 HRS. 70 1055 HRS HST  
 ASCENSION NO. 231

UPPER AIR DATA  
 0710020231  
 WHITE SANDS

SITE COORDINATES  
 488980.00 FEET E  
 185045.00 FEET N

TABLE VII (cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	DEGREES CENTIGRADE	REL HUM. PERCENT	SOUND METER	DENSITY GM/CUBIC	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES (TN)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION
93500.0	14.9	-43.9	0°	-0°	**	22.7	589.5	227.1	23.5	1.000005
94000.0	14.6	-43.5	0°	-0°	**	22.1	590.0	226.1	23.1	1.000005
94500.0	14.2	-43.1	0°	-0°	**	21.6	590.6	225.9	22.5	1.000005
95000.0	13.9	-42.7	0°	-0°	**	21.1	591.1	225.6	21.8	1.000005
95500.0	13.6	-42.3	0°	-0°	**	20.6	591.6	227.3	23.3	1.000005
96000.0	13.3	-41.9	0°	-0°	**	20.1	592.2	230.0	25.6	1.000004
96500.0	13.0	-41.4	0°	-0°	**	19.6	592.7	232.7	28.0	1.000004
97000.0	12.7	-41.3	0°	-0°	**	19.1	592.9	234.4	28.5	1.000004
97500.0	12.5	-41.1	0°	-0°	**	18.7	593.1	235.3	26.8	1.000004
98000.0	12.2	-41.0	0°	-0°	**	18.3	593.3	236.1	25.1	1.000004
98500.0	11.9	-40.8	0°	-0°	**	17.9	593.5	237.2	24.4	1.000004
99000.0	11.7	-40.7	0°	-0°	**	17.5	593.7	239.1	26.5	1.000004
99500.0	11.4	-40.5	0°	-0°	**	17.1	593.9	241.0	28.5	1.000004
100000.0	11.2	-40.3	0°	-0°	**	16.7	594.1	243.0	30.5	1.000004
100500.0	10.9	-40.2	0°	-0°	**	16.3	594.3	243.5	29.3	1.000004
101000.0	10.7	-40.0	0°	-0°	**	16.0	594.5	244.1	28.1	1.000004
101500.0	10.4	-39.9	0°	-0°	**	15.6	594.7	244.6	26.8	1.000003
102000.0	10.2	-39.7	0°	-0°	**	15.2	594.9	246.3	27.8	1.000003
102500.0	10.0	-39.6	0°	-0°	**	14.9	595.1	248.2	29.7	1.000003
103000.0	9.8	-39.4	0°	-0°	**	14.6	595.3	250.1	31.6	1.000003
103500.0	9.6	-39.3	0°	-0°	**	14.2	595.5			1.000003
104000.0	9.3	-39.1	0°	-0°	**	13.9	595.7			1.000003
104500.0	9.1	-39.0	0°	-0°	**	13.6	595.8			1.000003
105000.0	8.9	-38.8	0°	-0°	**	13.3	596.0			1.000003
105500.0	8.7	-38.7	0°	-0°	**	13.0	596.2			1.000003
106000.0	8.6	-38.5	0°	-0°	**	12.7	596.4			1.000003

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
 12 MAR. 70 1055 HRS MST  
 ASSEMBLION NO. 231

MANDATORY LEVELS  
 0710020231  
 WHITE SANDS

WSTN SITE COORDINATES  
 488580.00 FEET E  
 185045.00 FEET N

TABLE VIII

PRESSURE MILLIBARS	GEOPOTENTIAL FEET	TEMPERATURE DEGREES	AIR DEWPONT CENTIGRADE	REL.HUM. PERCENT	WIND DATA	
					DIRECTION DEGREES(TN)	SPEED KNOTS
850.0	4924.	1.8	-4.3	64.	271.4	4.0
800.0	6520.	-0.3	-7.1	60.	266.7	5.7
750.0	8212.	-2.0	-12.3	45.	241.6	7.9
700.0	10001.	-5.7	-17.5	39.	270.9	8.7
650.0	11889.	-10.7	-21.0	43.	308.4	13.6
600.0	13888.	-15.8	-24.7	47.	291.3	25.7
550.0	16021.	-20.7	-28.5	50.	281.4	34.8
500.0	18314.	-24.0	-31.8	49.	293.3	44.8
450.0	20808.	-30.1	-38.7	43.	294.7	54.6
400.0	23529.	-35.6	-45.2	37.	291.0	62.3
350.0	26537.	-43.0	0.	-0.**	284.8	68.7
300.0	29876.	-49.3	0.	-0.**	280.9	74.7
250.0	33762.	-53.7	0.	-0.**	285.7	75.7
200.0	38446.	-55.2	0.	-0.**	293.2	54.8
175.0	41244.	-55.3	0.	-0.**	289.4	49.2
150.0	44463.	-55.4	0.	-0.**	284.9	46.8
125.0	48464.	-57.2	0.	-0.**	281.9	37.9
100.0	52877.	-58.3	0.	-0.**	282.8	31.7
80.0	57455.	-61.5	0.	-0.**	274.0	38.6
70.0	60175.	-60.2	0.	-0.**	277.4	29.5
60.0	63347.	-57.9	0.	-0.**	281.8	41.2
50.0	67126.	-57.3	0.	-0.**	187.5	9.6
40.0	71791.	-50.3	0.	-0.**	248.4	24.3
30.0	77911.	-53.3	0.	-0.**	248.8	24.1
25.0	81804.	-48.7	0.	-0.**	258.2	23.2
20.0	86635.	-47.0	0.	-0.**	253.2	31.2
15.0	92915.	-44.1	0.	-0.**	228.0	23.3
10.0	101950.	-39.6	0.	-0.**	248.0	29.6

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET MSL  
 12 MAP - 70 1423 HRS MST  
 ASCFNCION NO. 232

SIGNIFICANT LEVEL DATA  
 0710020232  
 WHITE SANDS

TABLE IX

WSTM SITE COORDINATES  
 488580.00 FEET E  
 185045.00 FEET N

PRESSURE MILLIBARS	GEOMETRIC ALTITUDE MILLIBARS MSL FEET	TEMPERATURE AIR DEGREES	REL HUM PERCENT	
			DEGREE	CENTIGRADE
879.4	3989.0	9.9	-0.3	49.0
868.0	4342.5	6.1	-5.9	42.0
797.0	6613.3	0.	-6.0	64.0
775.0	7348.2	-1.3	-9.4	54.0
726.0	9043.7	-6.0	-12.6	60.0
718.0	9329.1	-5.4	-16.6	41.0
695.0	10165.8	-7.1	-20.0	35.0
563.0	15435.2	-19.5	-27.6	49.0
557.0	15697.1	-19.3	-27.9	47.0
429.0	21888.9	-34.5	-43.8	39.0
396.0	23708.8	-39.8	-48.4	40.0
388.0	24167.5	-39.9	-49.9	34.0
375.0	24933.1	-40.1	0.	0.**
346.0	26729.3	-43.0	0.	0.**
327.0	27981.0	-43.4	0.	0.**
266.0	32324.0	-49.9	0.	0.**
248.0	33996.3	-49.4	0.	0.**
221.0	36468.6	-52.1	0.	0.**
191.0	39583.7	-51.5	0.	0.**
172.0	41807.0	-55.0	0.	0.**
163.0	42942.9	-53.3	0.	0.**
137.0	46599.4	-57.0	0.	0.**
90.0	55326.2	-59.1	0.	0.**
83.0	56991.0	-61.7	0.	0.**
70.0	60472.4	-61.7	0.	0.**
62.0	62979.3	-57.3	0.	0.**
56.0	65090.2	-60.1	0.	0.**
35.0	74967.0	-51.7	0.	0.**
32.0	76877.9	-54.1	0.	0.**
26.0	81339.7	-48.4	0.	0.**

\*\*\* RELATIVE HUMIDITY NOT SUPPLIED. ZERO VALUE ASSUMED FOR COMPUTATIONS.

STATION ALTITUDE 3989.00 FEET MSL  
12 MAR. 70 1423 HRS MST  
ASCENSION NO. 232

SIGNIFICANT LEVEL DATA

OY1Q020232  
WHITE SANDS

WSTM SITE COORDINATES  
488580.00 FEET E  
185045.00 FEET N

TABLE IX (Cont)

PRESSURE MILLIBARS	GEOMETRIC ALTITUDE MSL FEET	TEMPERATURE DEGREES	AIR DEWPONT CENTIGRADE	REL.HUM. PERCENT
17.5	90061.4	-43.1	0.	-0. **
10.5	101420.9	-64.5	0.	-0. **
9.9	102735.3	-41.5	0.	-0. **

\*\* RELATIVE HUMIDITY NOT SUPPLIED. ZERO VALUE ASSUMED FOR COMPUTATIONS.

STATION ALTITUDE 3989.00 FEET MSL  
12 MAR. 70 1423 HRS MST  
ASCENSION NO. 232

UPPER AIR DATA  
0710020232  
WHITE SANDS

WEST SITE COORDINATES  
484930.00 FEET E  
105045.00 FEET N

TABLE X

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEWPOINT DEGREES CENTIGRADE			REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SOUND SPEED KNOTS	WIND DIRECTION DEGREES(TIN) KNOTS	INDEX OF REFRACTION
		9.9	9.8	-0.3					
3989.0	879.4	49.0	48.8	1079.7	658.8	20.0	20.1	1.000269	
4000.0	879.0	49.0	48.8	1079.8	658.8	22.4	22.4	1.000269	
4500.0	862.9	55.7	43.5	1076.4	650.8	24.6	24.6	1.000259	
5000.0	846.8	43.3	48.4	1061.4	649.2	27.4	27.4	1.000256	
5500.0	831.1	3.0	53.0	1046.6	647.6	31.4	31.4	1.000253	
6000.0	815.6	1.6	58.1	1032.2	646.1	35.3	35.3	1.000250	
6500.0	800.4	0.3	62.9	1017.9	644.5	39.7	39.7	1.000247	
7000.0	785.3	-0.7	58.7	1002.6	643.8	43.1	43.1	1.000241	
7500.0	770.5	-1.7	54.6	987.6	642.0	47.5	47.5	1.000235	
8000.0	755.8	-3.1	56.3	973.8	640.8	52.0	52.0	1.000231	
8500.0	741.4	-4.5	58.1	960.2	638.6	56.4	56.4	1.000227	
9000.0	727.2	-5.9	52.5	946.9	637.0	60.1	60.1	1.000223	
9500.0	713.2	-5.7	-17.3	928.6	637.0	63.5	63.5	1.000214	
10000.0	699.5	-6.8	-19.4	914.2	635.7	67.9	67.9	1.000211	
10500.0	685.8	-7.9	-20.5	900.2	634.4	72.6	72.6	1.000207	
11000.0	672.2	-9.1	-21.1	886.3	633.0	77.2	77.2	1.000204	
11500.0	658.9	-10.2	-21.6	872.7	631.6	81.8	81.8	1.000200	
12000.0	645.9	-11.4	-22.4	859.3	630.4	86.4	86.4	1.000197	
12500.0	633.1	-12.6	-23.2	846.1	628.7	91.0	91.0	1.000194	
13000.0	620.6	-13.8	-23.9	833.1	627.3	95.4	95.4	1.000191	
13500.0	608.3	-14.9	-24.6	820.4	625.8	100.0	100.0	1.000187	
14000.0	596.2	-16.1	-25.4	807.8	624.4	104.6	104.6	1.000184	
14500.0	584.4	-17.3	-26.1	795.5	623.0	109.2	109.2	1.000181	
15000.0	572.9	-18.5	-26.9	783.4	621.5	113.8	113.8	1.000178	
15500.0	561.5	-19.5	-27.7	770.8	620.5	118.4	118.4	1.000174	
16000.0	549.9	-20.0	-28.7	756.7	619.6	123.0	123.0	1.000172	
16500.0	538.5	-21.3	-29.9	744.6	618.1	127.6	127.6	1.000169	
17000.0	527.2	-22.5	-31.2	732.4	616.6	132.2	132.2	1.000166	
17500.0	516.2	-23.7	-32.5	720.9	615.0	135.8	135.8	1.000163	
18000.0	505.5	-25.0	-33.8	709.4	613.5	140.4	140.4	1.000160	

STATION ALTITUDE 3989.00 FEET MSL  
12 MAR. 70 1423 HRS MST  
ASCNSSION NO. 232

UPPER AIR DATA  
0710020232  
WHITE SANDS  
TABLE X (Cont.)

GEOMETRIC ALTITUDE MSL	PRESSURE MILLIBARS	TEMPERATURE AIR DEWPOINT DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	DIRECTION DEGREES(TN)	WIND SPEED KNOTS	INDEX OF REFRACTION
18500.0	494.9	-26.2	-35.1	43.4	698.0	612.0	316.1	1.000157
19000.0	484.6	-27.4	-36.4	42.7	686.9	610.5	313.0	1.000155
19500.0	474.5	-28.6	-37.7	42.1	676.0	608.9	309.4	1.000152
20000.0	464.6	-29.9	-38.9	41.4	665.2	607.4	305.1	1.000149
20500.0	454.9	-31.1	-40.2	40.8	654.6	605.9	301.5	1.000147
21000.0	445.4	-32.3	-41.5	40.1	644.3	604.3	298.3	1.000145
21500.0	436.1	-33.5	-42.8	39.5	634.1	602.8	297.6	1.000142
22000.0	426.9	-34.8	-44.0	39.1	624.0	601.1	296.3	1.000140
22500.0	417.6	-36.3	-45.3	39.3	614.2	599.3	294.1	1.000138
23000.0	408.5	-37.7	-46.6	39.6	604.6	597.5	292.0	1.000135
23500.0	399.7	-39.2	-47.9	39.9	595.1	595.6	289.9	1.000133
24000.0	390.9	-39.9	-49.3	36.2	583.8	594.7	287.0	1.000130
24500.0	382.3	-40.0	-54.8	19.2**	571.2	594.6	284.4	1.000127
25000.0	373.9	-40.2	0.0	0.0**	559.2	594.3	282.8	1.000125
25500.0	365.6	-41.0	0.0	0.0**	548.7	593.3	281.6	1.000122
26000.0	357.5	-41.8	0.0	0.0**	538.4	592.2	280.7	1.000120
26500.0	349.6	-42.6	0.0	0.0**	528.4	591.2	280.4	1.000118
27000.0	341.8	-43.1	0.0	0.0**	517.6	590.6	280.4	1.000115
27500.0	334.2	-43.2	0.0	0.0**	506.4	590.4	281.1	1.000113
28000.0	326.7	-43.4	0.0	0.0**	495.5	590.2	281.8	1.000110
28500.0	319.3	-44.2	0.0	0.0**	485.9	589.2	281.6	1.000108
29000.0	312.1	-44.9	0.0	0.0**	476.4	588.2	281.4	1.000106
29500.0	305.0	-45.7	0.0	0.0**	467.2	587.3	281.8	1.000104
30000.0	298.1	-46.4	0.0	0.0**	458.1	586.3	282.2	1.000102
30500.0	291.4	-47.2	0.0	0.0**	449.2	585.3	283.0	1.000100
31000.0	284.8	-47.9	0.0	0.0**	440.5	584.4	284.2	1.000098
31500.0	278.3	-48.7	0.0	0.0**	432.0	583.4	286.2	1.000096
32000.0	272.0	-49.4	0.0	0.0**	423.6	582.4	289.1	1.000094
32500.0	265.8	-49.8	0.0	0.0**	414.8	581.9	292.6	1.000092
33000.0	259.7	-49.7	0.0	0.0**	405.0	582.1	295.6	1.000090

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
12 MAR. 70 1423 HRS MST  
ASCENSION NO. 232

UPPER AIR DATA  
0710020232  
WHITE SANDS

HSTN. SITE COORDINATES  
488580.00 FEET E  
185045.00 FEET N

GEOMETRIC ALTITUDE MSL FEET  
PRESSURE AIR DEWPOINT DEGREES CENTIGRADE

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE DEGREES CENTIGRADE	REL. HUM. PERCENT	WIND DATA DIRECTION DEGREES(TRN)	INDEX OF REFRACTION
				KNOTS	
33500.0	253.8	-49.5	-0.0	298.6	1.0000088
34000.0	248.0	-49.4	-0.0	300.5	1.0000086
34500.0	242.2	-50.0	-0.0	302.3	1.0000084
35000.0	236.7	-50.5	-0.0	305.1	1.0000082
35500.0	231.2	-51.0	-0.0	303.8	1.0000081
36000.0	225.9	-51.6	-0.0	303.7	1.0000079
36500.0	220.7	-52.1	-0.0	347.8	1.0000077
37000.0	215.6	-52.0	-0.0	339.6	1.0000076
37500.0	210.6	-51.9	-0.0	331.6	1.0000074
38000.0	205.7	-51.8	-0.0	323.8	1.0000072
38500.0	200.9	-51.7	-0.0	316.2	1.0000070
39000.0	196.3	-51.6	-0.0	308.7	1.0000069
39500.0	191.8	-51.5	-0.0	301.4	1.0000067
40000.0	187.3	-52.2	-0.0	295.3	1.0000066
40500.0	182.9	-52.9	-0.0	289.4	1.0000064
41000.0	178.7	-53.7	-0.0	283.7	1.0000063
41500.0	174.5	-54.5	-0.0	278.1	1.0000062
42000.0	170.4	-54.7	-0.0	271.8	1.0000061
42500.0	166.5	-54.0	-0.0	264.6	1.0000059
43000.0	162.6	-53.4	-0.0	257.7	1.0000057
43500.0	158.7	-53.9	-0.0	252.2	1.0000056
44000.0	155.0	-54.4	-0.0	246.9	1.0000055
44500.0	151.4	-54.9	-0.0	241.6	1.0000054
45000.0	147.8	-55.4	-0.0	236.8	1.0000053
45500.0	144.3	-55.9	-0.0	231.4	1.0000052
46000.0	141.0	-56.4	-0.0	226.6	1.0000050
46500.0	137.6	-56.9	-0.0	221.8	1.0000049
47000.0	134.4	-57.1	-0.0	216.7	1.0000048
47500.0	131.2	-57.2	-0.0	211.7	1.0000047
48000.0	128.1	-57.0	-0.0	206.8	1.0000046

\*\* AT LAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THF INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
 12 MAY 70 1423 HRS HST  
 ASCENSION NIN. 23?

UPPER AIR DATA  
 0710020232  
 WHITE SANDS

WSTM SITE COORDINATES  
 400580.00 FEET E  
 185045.00 FEET N

TABLE X (cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES C	DEWPONENT DEGREES C	RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	DIRECTION DEGREES (TN)	WIND SPEED KNOTS	INDEX OF REFRACTION
48500.0	125.0	-57.5	0	-0	**	201.9	571.9	298.1	40.2
49000.0	122.0	-57.6	0	-0	**	197.3	571.7	298.6	39.6
49500.0	119.1	-57.7	0	-0	**	192.7	571.5	297.9	42.5
50000.0	116.3	-57.8	0	-0	**	188.2	571.4	297.1	45.5
50500.0	113.5	-57.9	0	-0	**	183.8	571.2	298.4	45.6
51000.0	110.8	-58.1	0	-0	**	179.5	571.1	299.6	45.8
51500.0	108.2	-58.2	0	-0	**	175.4	570.9	299.6	46.2
52000.0	105.6	-58.3	0	-0	**	171.3	570.7	299.0	46.8
52500.0	103.1	-58.4	0	-0	**	167.3	570.6	298.7	45.5
53000.0	100.7	-58.5	0	-0	**	163.4	570.4	298.0	41.4
53500.0	98.3	-58.7	0	-0	**	159.6	570.3	298.2	36.7
54000.0	95.9	-58.8	0	-0	**	155.9	570.1	292.9	29.0
54500.0	93.7	-58.9	0	-0	**	152.3	569.9	287.7	21.2
55000.0	91.4	-59.0	0	-0	**	148.8	569.6	284.6	21.1
55500.0	89.2	-59.4	0	-0	**	145.4	569.3	281.6	21.5
56000.0	87.1	-60.2	0	-0	**	142.5	568.3	278.6	21.9
56500.0	85.0	-60.9	0	-0	**	139.6	567.2	275.7	22.3
57000.0	82.0	-61.7	0	-0	**	136.7	566.2	275.9	26.6
57500.0	81.0	-61.7	0	-0	**	133.4	566.2	277.9	35.0
58000.0	79.0	-61.7	0	-0	**	130.2	566.2	277.9	35.5
58500.0	77.1	-61.7	0	-0	**	127.0	566.2	275.3	33.3
59000.0	75.2	-61.7	0	-0	**	124.0	566.2	271.3	30.5
59500.0	73.4	-61.7	0	-0	**	121.0	566.2	259.0	23.4
60000.0	71.6	-61.7	0	-0	**	118.0	566.2	246.7	17.3
60500.0	69.9	-61.7	0	-0	**	115.2	566.3	234.3	12.7
61000.0	68.2	-60.8	0	-0	**	114.9	567.4	222.0	8.7
61500.0	66.6	-59.9	0	-0	**	108.8	568.6	219.2	5.8
62000.0	65.0	-59.0	0	-0	**	105.8	569.8	231.4	4.5
62500.0	63.5	-58.1	0	-0	**	102.8	571.0	243.7	3.2
63000.0	61.9	-57.3	0	-0	**	100.0	572.0	264.4	8.2

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
12 MAR. 70 1423 HRS MST  
ASCENSION NO. 232

UPPER AIR DATA  
0710020232  
WHITE SANDS

WSTM SITE COORDINATES  
488580.00 FEET E  
185045.00 FEET N

TABLE X (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREEES CENTIGRADE	REL.HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	DIRECTION DEGREES(TN)	WIND SPEED KNOTS	INDEX OF REFRACTION
63500.0	60.5	-58.0	-0.	97.9	571.2	285.2	13.3	1.000022
64000.0	59.0	-58.7	-0.	95.9	570.3	291.3	16.1	1.000021
64500.0	57.6	-59.3	-0.	93.9	569.4	283.0	16.8	1.000021
65000.0	56.2	-60.0	-0.	91.9	568.5	274.6	17.5	1.000020
65500.0	54.9	-59.8	-0.	89.7	568.8	265.5	17.1	1.000020
66000.0	53.6	-59.3	-0.	87.4	569.4	256.4	16.7	1.000019
66500.0	52.4	-58.9	-0.	85.2	569.9	250.2	16.3	1.000019
67000.0	51.1	-58.5	-0.	83.0	570.5	249.4	16.1	1.000018
67500.0	49.9	-58.1	-0.	80.9	571.1	248.5	15.9	1.000018
68000.0	48.8	-57.6	-0.	78.8	571.6	247.7	14.8	1.000018
68500.0	47.6	-57.2	-0.	76.8	572.2	247.0	13.3	1.000017
69000.0	46.5	-56.8	-0.	74.9	572.8	248.1	12.3	1.000017
69500.0	45.4	-56.3	-0.	73.0	573.3	257.5	13.7	1.000016
70000.0	44.3	-55.9	-0.	71.1	573.9	266.9	15.0	1.000016
70500.0	43.3	-55.5	-0.	69.3	574.5	267.6	16.2	1.000015
71000.0	42.3	-55.1	-0.	67.5	575.0	265.1	17.4	1.000015
71500.0	41.3	-54.6	-0.	65.8	575.6	264.6	16.6	1.000015
72000.0	40.3	-54.2	-0.	64.1	576.1	266.5	19.9	1.000014
72500.0	39.4	-53.8	-0.	62.5	576.7	265.8	20.3	1.000014
73000.0	38.4	-53.4	-0.	60.9	577.2	252.8	16.8	1.000014
73500.0	37.5	-52.9	-0.	59.4	577.8	239.7	13.2	1.000013
74000.0	36.6	-52.5	-0.	57.9	578.4	235.6	11.9	1.000013
74500.0	35.8	-52.1	-0.	56.4	578.9	232.4	10.9	1.000013
75000.0	34.9	-51.7	-0.	55.0	579.4	231.1	11.3	1.000012
75500.0	34.1	-52.4	-0.	53.9	578.6	230.8	12.6	1.000012
76000.0	32.3	-53.0	-0.	52.8	577.7	232.8	14.2	1.000012
76500.0	32.6	-53.6	-0.	51.7	576.9	239.2	16.2	1.000012
77000.0	31.8	-53.9	-0.	50.6	576.5	245.5	18.2	1.000011
77500.0	31.1	-53.3	-0.	49.3	577.3	247.2	19.7	1.000011
78000.0	30.4	-52.7	-0.	48.0	578.2	249.0	21.1	1.000011

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
12 MAR. 70 1423 HRS MST  
ASCENSION NO. 232

UPPER AIR DATA  
0710020232  
WHITE SANDS  
TABLE X (Cont.)

GEOMETRIC ALTITUDE MCS FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES CENTIGRADE	DEWPOINT DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF WIND KNOTS	DIRECTION DEGREES (TAN)	WIND DATA KNOTS	INDEX OF REFRACTION
78500.0	29.7	-52.0	0.	**	46.8	579.0	248.5	21.3	1.000010
79000.0	29.0	-51.4	0.	-0.	45.5	579.8	246.3	20.7	1.000010
79500.0	28.3	-50.8	0.	**	44.4	580.7	244.6	20.1	1.000010
80000.0	27.7	-50.1	0.	-0.	43.2	581.5	243.5	20.5	1.000010
80500.0	27.0	-49.5	0.	-0.	42.1	582.3	242.4	20.9	1.000009
81000.0	26.4	-48.8	0.	-0.	41.0	583.2	241.5	21.3	1.000009
81500.0	25.8	-48.3	0.	-0.	40.0	583.9	242.0	22.2	1.000009
82000.0	25.2	-48.0	0.	-0.	39.0	584.3	242.5	23.1	1.000009
82500.0	24.7	-47.7	0.	-0.	38.1	584.7	243.0	24.1	1.000008
83000.0	24.1	-47.4	0.	**	37.2	585.1	243.9	25.2	1.000008
83500.0	23.6	-47.1	0.	-0.	36.3	585.4	244.7	26.3	1.000008
84000.0	23.0	-46.8	0.	-0.	35.5	585.8	246.3	27.7	1.000008
84500.0	22.5	-46.5	0.	-0.	34.6	586.2	249.1	29.5	1.000008
85000.0	22.0	-46.2	0.	-0.	33.8	586.6	251.9	31.3	1.000008
85500.0	21.5	-45.9	0.	-0.	33.0	587.0	251.6	31.4	1.000007
86000.0	21.0	-45.6	0.	-0.	32.2	587.4	249.0	29.9	1.000007
86500.0	20.6	-45.3	0.	-0.	31.5	587.8	246.2	28.4	1.000007
87000.0	20.1	-45.0	0.	-0.	30.7	588.2	247.8	26.9	1.000007
87500.0	19.7	-44.7	0.	-0.	30.0	588.6	251.8	28.5	1.000007
88000.0	19.2	-44.4	0.	-0.	29.3	589.0	255.7	26.4	1.000006
88500.0	18.8	-44.0	0.	-0.	28.6	589.4	252.3	26.0	1.000006
89000.0	18.4	-43.7	0.	-0.	27.9	589.8	246.5	22.6	1.000006
89500.0	18.0	-43.4	0.	-0.	27.2	590.1	240.7	19.2	1.000006
90000.0	17.5	-43.1	0.	-0.	26.6	590.5	242.9	28.6	1.000006
90500.0	17.2	-43.2	0.	-0.	26.0	590.5	245.1	24.5	1.000006
91000.0	16.8	-43.2	0.	-0.	25.4	590.4	249.4	30.8	1.000006
91500.0	16.4	-43.3	0.	-0.	24.9	590.4	243.9	17.9	1.000006
92000.0	16.0	-43.3	0.	-0.	24.3	590.3	238.4	27.7	1.000005
92500.0	15.7	-43.4	0.	-0.	23.8	590.2	233.8	17.7	1.000005
93000.0	15.3	-43.5	0.	-0.	23.3	590.2	240.0	19.4	1.000005

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
 12 MAP • 70 1423 HRS MST  
 ASCENSION NO. 232

UPPER AIR DAT A  
 0710020232  
 WHITE SANDS

WSTN SITE COORDINATES  
 488580.00 FEET E  
 185045.00 FEET N

TABLE X (Cont.)

GEOMETRIC ALTITUDE MFT FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	DEWPOINT CENTIGRADE	REL-HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	DIRECTION DEGREES(UTN)	WIND DATA SPEED KNOTS	INDEX REFRACTION
93500.0	15.0	-43.5	0.	-0.	**	22.7	590.0	246.2	20.5
94000.0	14.7	-43.6	0.	-0.	**	22.2	590.0	251.1	22.1
94500.0	14.3	-43.6	0.	-0.	**	21.8	589.9	250.1	24.1
95000.0	14.0	-43.7	0.	-0.	**	21.3	589.8	249.1	26.1
95500.0	13.7	-43.8	0.	-0.	**	20.8	589.7	248.6	27.7
96000.0	13.4	-43.8	0.	-0.	**	20.4	589.6	249.6	28.5
96500.0	13.1	-43.9	0.	-0.	**	19.9	589.6	250.5	29.3
97000.0	12.8	-44.0	0.	-0.	**	19.5	589.5	251.5	30.4
97500.0	12.5	-44.0	0.	-0.	**	19.0	589.4	252.2	32.8
98000.0	12.2	-44.1	0.	-0.	**	18.6	589.3	252.9	35.3
98500.0	12.0	-44.1	0.	-0.	**	18.2	589.2	253.7	37.7
99000.0	11.7	-44.2	0.	-0.	**	17.8	589.2		1.000004
99500.0	11.4	-44.3	0.	-0.	**	17.4	589.1		1.000004
100000.0	11.2	-44.3	0.	-0.	**	17.0	589.0		1.000004
100500.0	10.9	-44.4	0.	-0.	**	16.7	588.9		1.000004
101000.0	10.7	-44.4	0.	-0.	**	16.3	588.9		1.000004
101500.0	10.5	-44.3	0.	-0.	**	15.9	589.0		1.000004
102000.0	10.2	-43.2	0.	-0.	**	15.5	590.5		1.000003
102500.0	10.0	-42.0	0.	-0.	**	15.1	591.9		1.000003

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
12 MAR. 70 1423 HRS MST  
ASCENSION NO. 232

MANDATORY LEVELS  
0710020232  
WHITE SANDS

TABLE XI

WSTM SITE COORDINATES  
488580.00 FEET E  
185045.00 FEET N

PRESSURE MILLIBARS	GEOPOTENTIAL FEET	DEGREES CENTIGRADE	TEMPERATURE AIR DEWPOINT CENTIGRADE	REL. HUM. PERCENT	WIND DATA	
					DIRECTION DEGREES(TN)	SPEED KNOTS
850.0	4903.	4.6	-5.6	47.	24.4	10.1
800.0	6512.	0.3	-6.0	53.	27.9	10.7
750.0	8199.	-3.7	-11.0	57.	347.1	8.1
700.0	9976.	-6.7	-19.3	38.	299.7	12.5
650.0	11859.	-11.0	-22.2	39.	306.8	19.6
600.0	13858.	-15.8	-25.1	45.	319.3	24.8
550.0	15992.	-20.0	-28.7	47.	322.9	24.9
500.0	16285.	-25.6	-34.5	44.	316.6	26.5
450.0	20761.	-31.7	-40.9	40.	299.7	36.5
400.0	23454.	-39.1	-47.8	40.	290.0	44.2
350.0	26438.	-42.6	0.	-0.**	280.4	57.2
300.0	29831.	-46.2	0.	-0.**	282.1	63.5
250.0	33764.	-49.5	0.	-0.**	299.8	62.7
200.0	38523.	-51.7	0.	-0.**	295.7	48.4
175.0	41355.	-54.4	0.	-0.**	290.4	40.2
150.0	44598.	-55.1	0.	-0.**	290.6	49.4
125.0	48391.	-57.5	0.	-0.**	298.1	40.2
100.0	53805.	-58.6	0.	-0.**	298.8	40.2
80.0	57578.	-61.7	0.	-0.**	276.9	36.2
70.0	60292.	-61.7	0.	-0.**	235.2	12.9
60.0	63462.	-58.2	0.	-0.**	291.7	14.6
50.0	67212.	-58.1	0.	-0.**	248.6	16.0
40.0	71867.	-54.1	0.	-0.**	266.9	20.2
30.0	77984.	-52.3	0.	-0.**	249.4	21.8
25.0	81866.	-47.9	0.	-0.**	242.7	23.5
20.0	86729.	-44.9	0.	-0.**	248.5	28.1
15.0	93074.	-43.5	0.	-0.**	246.1	20.5
10.0	102006.	-42.0	0.	-0.**	246.1	20.5

\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

RELEASE TIME (MST)	PIBAL	SECOND-STAGE IMPACT DISPLACEMENT, IN MILES DUE TO WIND						THEORETICAL IMPACT FROM LAUNCHER (IN MILES)		
		11-216 FT	216-4000 FT	4000-61000 FT	TOTAL		AZI-MUTH (DEG- REES)	RANGE	N-S	E-W
RAWIN- SONDE	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	RANGE	
1055	1155	2.8N	1.4E	1.5N	0.3W	8.6N	22.7W	12.9N	21.6W	344.1
1055	1225	6.3N	1.2W	5.9N	0.2E	8.6N	22.7W	20.8N	23.7W	344.2
1055	1300	5.5N	0.0	5.3N	1.9E	8.6N	22.7W	19.4N	20.8W	346.5
1055	1310	3.9N	0.6W	5.4N	0.8E	8.6N	22.7W	17.9N	22.5W	344.6
1055	1315	4.2N	0.3W	8.2N	5.5E	8.6N	22.7W	21.0N	17.5W	349.7
1055	1325	3.6N	2.8E	5.5N	5.1E	8.6N	22.7W	17.7N	14.8W	351.7
1055	1335	8.0N	5.7E	9.1N	2.3E	8.6N	22.7W	25.7N	14.7W	352.8
1055	1345	7.6N	3.5E	12.6N	3.1E	8.6N	22.7W	28.8N	16.1W	352.0
1055	1350	9.5N	3.0E	11.7N	3.6E	8.6N	22.7W	29.8N	16.1W	352.1
1055	1400	8.1N	1.0W	13.6N	3.2E	8.6N	22.7W	30.3N	20.5W	348.7
1055	1410	11.7N	2.6E	13.3N	3.7E	8.6N	22.7W	33.6N	16.4W	352.3
1055	1418	10.3N	1.9E	16.9N	2.8E	8.6N	22.7W	35.8N	18.0W	351.3
1423*	1422*	10.1N	0.0	15.2N	3.8E	9.3N	20.2W	34.6N	16.4W	352.4

TABLE XII. IMPACT PREDICTION DATA  
NIKE-HYDAC STV-92

\* Post-Shoot Data

	AZI. <sup>o</sup> MUTH (DE- GREES)	MILES FROM LAUNCHER	
	RANGE	N-S	E-W
LAUNCHER SETTING (ELEVATION 87.0 DEGREES QE)	014.0	42.0	40.8N 10.2E
NO WIND IMPACT	008.8	41.3	40.8N 6.3E
PREDICTED SECOND-STAGE IMPACT	352.5	71.0	70.4N 9.3W
SECOND-STAGE IMPACT, RADAR TRACK	349.8	80.0	78.7N 14.1W
PREDICTED BOOSTER IMPACT	060.0	1.0	0.5N 0.9E
ACTUAL BOOSTER IMPACT	N/A	N/A	N/A

TABLE XII. IMPACT PREDICTION DATA  
NIKE-HYDAC STV-92

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13. ABSTRACT

Meteorological data gathered for launching of NIKE-HYDAC, STV-92, are presented for the Space and Missile Systems Organization, AFMDC, Holloman Air Force Base, New Mexico, and for ballistic studies. The data appear, along with calculated ballistic data, in tabular form. ( ) ↑

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